

УДК 565.763.2(477)

## PSOCOPTERA (INSECTA) IN EOCENE ROVNO AMBER (UKRAINE)

M. S. Engel<sup>1</sup>, E. E. Perkovsky<sup>2</sup>

<sup>1</sup> *Natural History Museum, 1345 Jayhawk Boulevard-Dyche Hall, University of Kansas, Lawrence, Kansas 66045-7163, United States and Division of Invertebrate Zoology, American Museum of Natural History*  
E-mail: msengel@ku.edu

<sup>2</sup> *I. I. Schmalhausen Institute of Zoology, NAS of Ukraine, Bogdan Chmielnicky str., 15, Kyiv, 01601 Ukraine*  
E-mail: perkovsky@fromru.com; perkovsk@gmail.com

Accepted 12 September 2005

**Psocoptera (Insecta) in Eocene Rovno Amber (Ukraine).** Engel M. S., Perkovsky E. E. — A brief, annotated checklist of the described barklouse (Paraneoptera, Psocodea, Psocoptera) fauna from Rovno amber is provided. All species are also documented in the roughly contemporaneous Baltic amber fauna. The fauna includes representatives of all three suborders and most major lineages of the Psocoptera, including the interesting families Archipsocidae and Sphaeropsocidae.

**Key words:** Paraneoptera, Psocodea, Psocoptera, barklice, booklice, amber, checklist, Psocomorpha, Trogiomorpha, Troctomorpha, palaeontology.

**Psocoptera (Insecta) в эоценовом ровенском янтаре (Украина).** Энгель М. С., Перковский Е. Э. — Впервые приведен краткий аннотированный список сеноедов (Paraneoptera, Psocodea, Psocoptera) эоценового ровенского янтаря. Все виды известны также из одновозрастного балтийского янтаря. Фауна включает в себя представителей всех трех подотрядов и большинства филогенетических линий Psocoptera, включая интересные семейства Archipsocidae и Sphaeropsocidae.

**Ключевые слова:** Paraneoptera, Psocodea, Psocoptera, сеноеды, янтарь, аннотированный список, Psocomorpha, Trogiomorpha, Troctomorpha, палеонтология.

The barklice (order Psocoptera), or booklice, are small, frequently overlooked insects of the Paraneoptera (i. e., Acercaria, hemipteroid insects). The order is perhaps most famous for having given rise to the ectoparasitic true lice, order Phthiraptera, thereby rendering Psocoptera paraphyletic (Grimaldi, Engel, 2005). The barklouse fauna will undoubtedly continue to grow as more material is excavated and studied. Unlike the true lice, however, barklice have an extensive and well-documented fossil record from the Late Paleozoic (admittedly, many of these species are stem-group Acercaria, stem-group Psocodea, or stem-group Psocoptera rather than true Psocoptera) through the Late Tertiary. The order is particularly well represented in fossiliferous resins of all ages and geographical regions (e. g., Grimaldi, Engel, 2005; Weitschat, Wichard, 2002). Herein we provide records of barklice documented from Rovno amber of the Ukraine. Specimens K-11 and KF-9 come from Klesov, the remaining specimens originate from either Klesov or Dubrovitsa (Perkovsky et al., 2003). All specimens are kept in the Amber Collection of the Schmalhausen Institute of Zoology of the National Academy of Sciences of Ukraine (Kyiv, SIZK). Each of these species also occurs in the more intensively studied and collected Baltic amber.

The names *Copostigma affinis* (Hagen), *Epipsocus ciliatus* (Hagen), and *Caecilius prometheus* Enderlein are still in common use by modern palaeoentomologists interest-

ed in Baltic amber. However, each of these names has nomenclatural problems (e. g., *C. affinis* and *E. ciliatus*) or has been transferred to different genera by psocopteran neontologists (e. g., *C. prometheus*). Rather than employ the name in common usage by amber researchers we have adopted the nomenclaturally valid name (e. g., Lienhard, Smithers, 2002). It is hoped that by specifically mentioning these changes here they will be followed by palaeoentomologists in the future.

**ORDER PSOCOPTERA**

**Suborder PSOCOMORPHA**

**Infraorder CAECILISETAE**

**Family CAECILIUSIDAE**

*Valenzuela prometheus* (Enderlein) (fig. 1)

*Caecilius prometheus* Enderlein, 1911: 318;  
*Valenzuela prometheus* (Enderlein): Mockford, 2001: 83.

Material. SIZK: KF-9, Klesov, Rovno amber, Eocene.

Comments. *Valenzuela* is distributed throughout the world and, with 300 named species, is presently the most species-rich genus in the order Psocoptera.



Fig. 1–2. Rovno amber barklice (Psocoptera): 1 — *Valenzuela prometheus* (KF-9, Klesov, Rovno amber, Eocene); 2 — *Psocidus multiplex* (UA-1319, Rovno amber, Eocene).

Рис. 1–2. Сеноеды ровенского янтаря: 1 — *Valenzuela prometheus* (KF-9, Клесов, ровенский янтарь, эоцен); 2 — *Psocidus multiplex* (UA-1319, ровенский янтарь, эоцен).

**Infraorder PSOCETAE****Family PSOCIDAE*****Psocidus multiplex* (Roesler) (fig. 2)**

*Psocus affinis* Hagen, 1856: Pictet-Baraban, Hagen, 1856: 58. *Nomen praeoccupatum*, nec *Psocus affinis* Rambur, 1842;  
*Copostigma affinis* (Hagen): Enderlein, 1911: 308;  
*Copostigma affinis* ab. *pachystigma*: Enderlein, 1911: 308;  
*Copostigma affinis* ab. *clematostigmoides*: Enderlein, 1911: 308;  
*Copostigma affinis* ab. *pachystigmoides*: Enderlein, 1911: 308;  
*Psocus multiplex* Roesler, 1943: 13. *Nomen novum pro Psocus affinis* Hagen, 1856;  
*Psocidus multiplex* (Roesler): Roesler, 1943: 13.

Material. SIZK: UA-1319, UA-1043. Both in Rovno amber, Eocene.

Comments. *Psocidus* consists of 90 named species distributed throughout the world except in North America or oceanic islands.

**Infraorder EPIPSOCETAE****Family EPIPSOCIDAE*****Epipsocus avus* (Roesler) (fig. 3)**

*Psocus ciliatus* Pictet-Baraban, Hagen, 1856: 59; *Nomen praeoccupatum*, nec *Psocus ciliatus* Latreille, 1794;  
*Epipsocus ciliatus* (Pictet-Baraban, Hagen): Hagen, 1866: 207;  
*Psocus avus* Roesler, 1943: 13. *Nomen novum pro Psocus ciliatus* Pictet-Baraban, Hagen, 1856;  
*Epipsocus avus* (Roesler): Roesler, 1943: 13.

Material. SIZK: K-11, Klesov, Rovno amber, Eocene.

Comments. This is a circumtropical genus of barklice, occurring in South and Central America, tropical Asia, and in Tanzania. There are presently 33 species documented in the genus.

**Infraorder HOMIOPSOCIDEA****Family ARCHIPSOCIDAE*****Archipsocus puber* Hagen (fig. 4)**

*Archipsocus puber* Hagen, 1882: 222.

Material. SIZK: UA-1757a (syninclusion — ant *Ctenobethylus goepperti* (Mayr)), Rovno amber, Eocene.

Comments. *Archipsocus* is a fascinating genus of enigmatic barklice notable for their communal behavior, the only such societies documented within the Psocoptera. The genus, consisting of 81 named species, is of cosmopolitan distribution except the Western Palaearctic where the genus is documented only as fossils. The family is sometimes placed in its own infraorder, Archipsocetae.

**Suborder TROGIOMORPHA****Infraorder ATROPETAE****Family EMPHERIIDAE*****Trichempheria villosa* (Hagen) (fig. 5)**

*Empheria villosa* Hagen, 1882: 221;  
*Trichempheria villosa* (Hagen): Enderlein, 1911: 345.

Material. SIZK: UA-437, Rovno amber, Eocene.

Comments. The family Empheriidae is known only from the fossil record and as inclusions in amber from the Cretaceous, Early and Middle Tertiary (Baz, Ortuño, 2001).

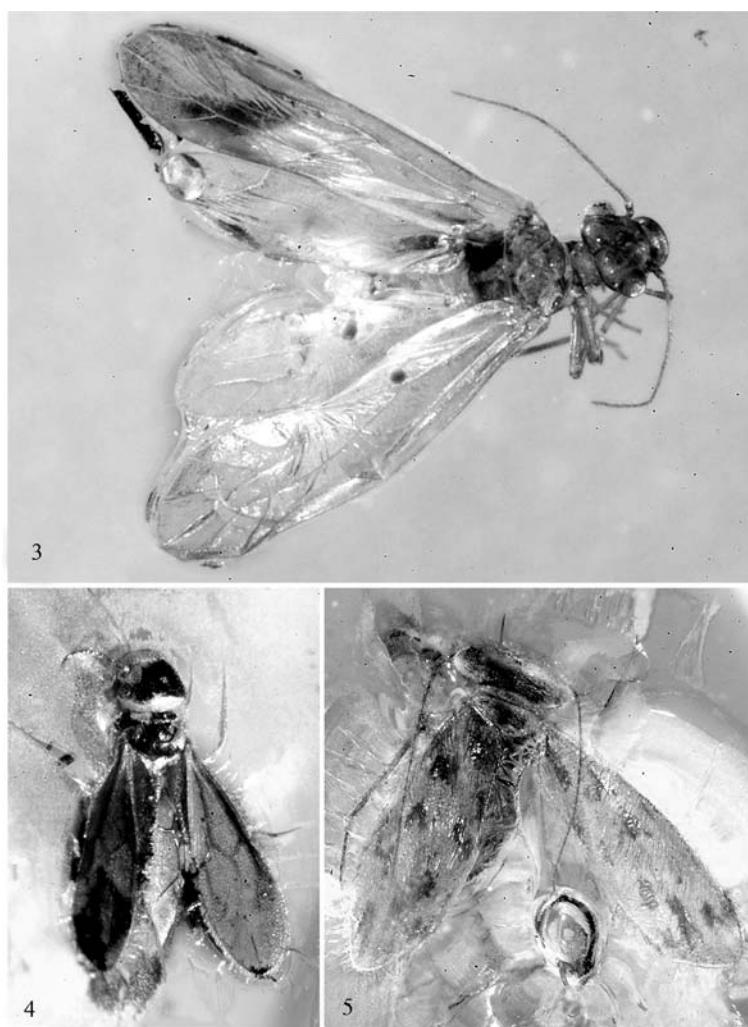


Fig. 3–5. Rovno amber barklice (Psocoptera): 3 — *Epipsocus avus* (K-11, Klesov, Rovno amber, Eocene); 4 — *Archipsocus puber* (UA-1757, Rovno amber, Eocene); 5 — *Trichempheria villosa* (UA-437, Rovno amber, Eocene).

Рис. 3–5. Сеноеды ровенского янтаря (Psocoptera): 3 — *Epipsocus avus* (K-11, Клесов, ровенский янтарь, эоцен); 4 — *Archipsocus puber* (UA-1757, ровенский янтарь, эоцен); 5 — *Trichempheria villosa* (UA-437, ровенский янтарь, эоцен).

#### Suborder TROCTOMORPHA

#### Infraorder NANOPSOCETAE

#### Family SPHAEROPSOCIDAE

#### *Sphaeropsocus kuenowii* Hagen

*vide* Engel, Perkovsky (2006).

**Comments.** The family Sphaeropsocidae is notable for the elytriform forewings of females, among other traits. The family is also documented in Late Cenomanian amber from Agapa (History..., 2002), and in Campanian amber from Canada and Neocomian amber from Lebanon (Grimaldi, Engel, 2005, in review).

In Rovno amber *S. kuenowii* is known from both Klesov [syninclusions of K-1039 from piece 2–42 with weight of 33 g (K-1034–K-1042): two *Palaeomyia*, Braconidae, *Germaraphis*, Thysanoptera, and nine Acari] and Dubrovitsa [syninclusions of D-2222c

from D-2221–D-2222: four *Ctenobethylus goepperti* (Mayr), Collembola (Arthropleona), and Acari] (vide Engel, Perkovsky, 2006).

Partial support for this work was provided by United States National Science Foundation grant EF-0341724 (to MSE) and The Paleontological Society, Sepkoski grant for 2002 (to EEP). This is contribution No. 3434 of the Division of Entomology, University of Kansas Natural History Museum.

*Baz A., Ortuño V. M.* New genera and species of empheriids (Psocoptera: Empheriidae) from the Cretaceous amber of Alava, northern Spain // Cretaceous Research. — 2001. — **22**, N 5. — P. 575–584.

*Enderlein G.* Die fossilen Copeognathen und ihre Phylogenie // Palaeontographica. — 1911. — **58**. — S. 279–360.

*Engel M. S., Perkovsky E. E.* Sphaeropsocus kuenowii Hagen in Rovno amber from the Ukraine (Psocoptera: Sphaeropsocidae) // Entomological News. — 2006.

*Grimaldi D., Engel M. S.* Evolution of the Insects. — Cambridge : Cambridge Univ. Press, 2005. — xv + 755 p.

*Hagen H. A.* Psocinorum et Embidinorum Synopsis synonymica // Verhandl. Zool.-Botan. Gesellschaft Wien. — 1866. — **16**. — S. 201–222.

*Hagen H. A.* Beiträge zur Monographie der Psociden. Über Psociden in Bernstein // Stet. Entomol. Zeitung. — 1882. — **43**. — S. 217–237, 265–276, 276–300, 524–526.

*History of Insects /* Eds A. P. Rasnitsyn, D. L. J. Quicke. — Dordrecht : Kluwer Acad. Publish., 2002. — xii + 517 p.

*Mockford E. L.* Additions and corrections to “A classification of the psocopteran family Caeciliusidae (Caeciliidae auct.)” // Transactions of the American Entomol. Soc. — 2001. — **127**, N 1. — P. 79–84.

*Latreille P. A.* Extrait d'un mémoire pour servir de suite à l'histoire des Termes, ou fourmis blanches // Bul. Sci. Soc. Philomathique de Paris. — 1794. — 1. — P. 84–85.

*Lienhard C., Smithers C. N.* Psocoptera (Insecta): World Catalogue and Bibliography. — Geneva : Muséum d'Histoire Naturelle — Instrumenta Biodiversitatis V, 2002. — xli + 745 p.

*Perkovsky E. E., Zosimovich V. Yu., Vlaskin A. P.* Rovno amber fauna: A preliminary report // Acta zool. cracovien. — 2003. — **46** (suppl.). — P. 423–430.

*Pictet-Baraban F. J., Hagen H.* Die im Bernstein befindlichen Neuropteren der Vorwelt // Die im Bernstein befindlichen organischen Reste der Vorwelt / Ed G. C. Berendt. — Berlin : Nicolaischen Buchhandlung, 1856. — Vol. 2. — P. 41–126.

*Rambur J. P.* Histoire Naturelle des Insectes: Névroptères. — Paris : Fain et Thunot, 1842. — xvii + 534 p.

*Roesler R.* Über einige Copeognathengenera // Stet. Entomol. Zeitung. — 1943. — **104**. — S. 1–14.

*Weitschat W., Wichard W.* Atlas of Plants and Animals in Baltic Amber. — Münich : Friedrich Pfeil, 2002. — 256 p.